

METHOD FOR VARYING THE MELTING POINTS  
AND MOLECULAR WEIGHTS OF POLYOLEFINS USING  
METALLOCENE CATALYST SYSTEMS

ABSTRACT

The present invention provides a method for varying the melting points and molecular weights of polyolefins by changing the structure of the catalyst used in the polymerization. The catalysts that are useful in the present invention are chiral, stereorigid metallocene catalyst of the formula  $R''(C_5R'_m)_2MeQ$ . The catalysts include a bridge structure between the  $(C_5R'_m)$  groups and may contain substituents on the groups. It has been discovered that the melting points and molecular weights of the polymers produced by such catalysts are influenced by the bridge and substituents added to the  $(C_5R'_m)$  groups. Thus, the present invention provides a method for varying the melting points of the polymer product and a method of varying the molecular weights of the product by changing the components and structure of the metallocene catalysts. The present invention also provides a process for polymerizing olefins in which the melting points and/or molecular weights of the product may be controlled. Also included in the invention is the discovery that the melting points of the products are controlled by the number of inversions in the xylene insoluble fraction of the polymer.